



2000 DOE Pollution Prevention Awards

April 2000



Department of Energy
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The Albuquerque Operations Office, National Pollution Prevention Program is proud to offer this summary of the fiscal year 2000 DOE Pollution Prevention Award submissions. I would like to congratulate all the award nominees for your hard work and dedication to the DOE Pollution Prevention Program, your efforts are recognized and appreciated by the Department.

The purpose of this summary is to highlight, recognize, and make available to the Complex and interested parties the pollution prevention activities submitted by the DOE Complex for the fiscal year 2000 Awards Program. A total of 70 nominations were submitted from across the DOE Complex. Two of the award categories had individual award recipients. For the award category, Executive Order 12856 Individual Challenge, Dr. Karen Hooker from Savannah River won the award. Donna Merry, from Hanford won for the Model Facility Demonstration category. Two nominations each were selected for the Public Outreach category and for the Affirmative Procurement category. In the remaining ten Pollution Prevention Award Categories, one nomination was selected for the DOE National Award. The 12 award categories for fiscal year 2000 were: Public Outreach, Environmental Preferability, Waste Prevention, Sowing the Seeds for Change, Model Facility Demonstration, Recycling, Affirmative Procurement, Environmental Restoration, Information Sharing, Integrated Planning and Design, Executive Order 12856 Individual Challenge, and Complex-Wide Achievement.

Special thanks to those of you who took the time to submit the award nominations which made this publication possible. I hope that you will find this summary useful and informative. I encourage you to review this brochure and contact the individuals that submitted the nominations to get additional information that may be useful to you and your site. If you have any comments regarding this publication, please call Mr. Mike Sweitzer, DOE Albuquerque Operations Office, National Pollution Prevention Program, at (505) 845-4347.

RE Glass

R. E. Glass
Manager



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Individual Awards

EO 12856 Individual Challenge

SRS P2 Program Manager, Dr. Karen Hooker

As the Director for the Program Management and Coordination Division at the U.S. Department of Energy, Savannah River (SR) Operations Office, Dr. Karen Hooker has



championed the SRS Pollution Prevention Program. Under Dr. Hooker's leadership and vision, the SRS Pollution Prevention Program Team has developed and implemented a comprehensive program that establishes pollution prevention as an integral business strategy and a cornerstone of the Site's ISO 14000 certified environmental management system. She has used her capabilities, position and program involvement to make P2 an integral part of Site operations.

Under Dr. Hooker's leadership, SR completed 508 P2/WMin projects avoiding 490,000 cubic feet of solid radioactive and hazardous waste and has saved the taxpayer approximately \$137 million in life cycle cost for waste disposal. The following is a list of some of the more notable achievements.

- Created the first Department of Energy Performance Based Incentive for Pollution Prevention that is used as a model throughout the DOE complex.
- Created the first sustainable Set-Aside Fee Program to tax waste generators and use the revenue for high return on investment projects that would reduce waste generation.
- First DOE ISO 14001, Environmental Management System, certified site with the Pollution Prevention Program being a key element of achieving certification.

The SRS P2 Program is recognized as one of the best and most consistent achieving programs in the DOE. Dr. Hooker has developed a tremendous heritage of excellence and leading-edge program management and execution. She has earned the respect and admiration of personnel at DOE Headquarters, the DOE Complex, and at the Savannah River Site.

For more information, contact Steve Mackmull, SR at (803) 725-3817.

Model Facility Demonstration

Outstanding Contribution to Hanford's Pollution Prevention Success, Donna Merry

Hanford's successes in pollution prevention, are largely attributed to Ms. Donna Merry. Her tireless efforts in designing a new way of doing business have made Hanford a



model facility in waste prevention and recycling. The comprehensive program she built over the years has achieved great dividends in waste reduction, cost savings, awareness, and employee and program recognition.

In 1994 the program activities simply consisted of: (1) Reporting requirements; and (2) Implementation of individual pollution prevention (P2) programs at each facility. Ms. Merry designed a robust program with emphasis on achieving greater waste reduction and recycling. The elements of the revised pollution prevention program included:

- technical Assistance;
- awareness;
- Pollution Prevention Opportunity Assessments (P2OA's);
- return on investment (ROI) program;
- a Sitewide P2 Program Plan;
- goals, performance indicators, and tracking; and
- reporting.

As a result of the Hanford Site environmental clean up mission and waste minimization strategies, waste reduction at Hanford has been dramatic.

Due to Ms. Merry's efforts, the waste generation trends for routine waste streams show drastic decline. Since 1993, the Hanford Site reduced Low Level Waste 86.3%; Mixed Low Level waste 76.1%; Hazardous waste 79.7%; Sanitary waste 89.3%; and Toxic Chemical Release 100%. Hanford achieved a 62.3% Sanitary waste recycling rate and affirmative procurement purchases increased to 99.3%.

For more information, contact Anna Beard, RL at (509) 376-7472.

2000 DOE Pollution Prevention Awards

AFFIRMATIVE PROCUREMENT

ANL-E Affirmative Procurement Program Activities (FY99)

The ANL-E Affirmative Procurement Program has significantly improved the availability (and visibility) of recycled-content products for Laboratory employees and has



implemented multiple educational activities, and established resources, to inform Laboratory employees, and vendors, of recycled-content products requirements under E.O. 13101.

During FY99, the Procurement Division performed the following activities in order to incorporate recycled-content product

purchases into the AMOS and PARIS systems.

- The Procurement Division reviewed approximately 2 million items available for order through the AMOS database to identify which items available through AMOS fall within the EPA list of designated recycled-content product categories.
- The Procurement Division, in conjunction with the AMOS strategic suppliers, reviewed and identified which products provided by each supplier met the requirements for recycled material content, per EPA Designated Item Specifications. This activity required a significant effort, involving the review of vendor catalogs, specification sheets, and in direct communications with vendors and/or product manufacturers.

As a result of the ANL-E Affirmative Procurement program's efforts, purchasing recycled-content products has been made easier for employees, tracking of purchases is less difficult, and the overall awareness level for "buying recycled" is at an all time high. As proof of the effectiveness of the ANL-E Affirmative Procurement Program, the Laboratory's percentage for purchases of recycled-content products dramatically increased during FY99 to 70%, as compared to 42% in FY98, and 31% in FY97.

For more information, contact Keith Trychta, ANL-E at (630) 252-1476.

AFFIRMATIVE PROCUREMENT

An Affirmative Procurement Showplace at the Idaho National Engineering and Environmental Laboratory

The INEEL's "Green" purchasing program gains attention in the DOE complex. Buy recycled considerations have successfully become part of normal purchasing practice.



Developed, implemented and evaluated over the past two years at the INEEL, the program became effective January 1, 1999. It now operates in 100 percent conformance to Section 6002 of the Resource Conservation and Recovery Act and Executive Order 13101 at the INEEL.

The INEEL is the first DOE site to use a senior procurement professional as its program lead to implement AP into all aspects of daily purchasing activities, supported by expertise from Pollution Prevention. The INEEL's program is the first also to integrate a unique, comprehensive coding process for accurate, automated data tracking and compilation. Company-level acquisition procedures

were revised to give preference to buying the EPA-designated items with recycled content, to require specification and item description reviews, to provide for supplier certifications and recovered material reporting methods, and to include AP in the DOE-Idaho Architectural and Engineering Standards.

The Affirmative Procurement program addresses all methods of purchasing, including purchase (credit) cards, which are restricted for use in buying EPA-designated items. To make sure the program continually evolves and improves, annual compliance assessments are conducted. The analysis ensures the INEEL is fulfilling the intent of Affirmative Procurement to the maximum extent practicable and satisfies reporting requirements.

Affirmative Procurement functions as part of the INEEL Pollution Prevention program and is an institutionalized component of the Integrated Safety Management System. ISMS aims to systematically integrate safety into all facets of work planning and execution. Safety specifically includes environment and pollution prevention considerations. Affirmative Procurement at the Laboratory enjoys considerable management and employee support. The collaboration between procurement and environmental staff, and those who need EPA-designated items, is exemplary.

For more information, contact Mary-Ann Somsen, INEEL at (208) 526-4501.

COMPLEX-WIDE ACHIEVEMENT

National Center of Excellence for Metals Recycle

The National Center of Excellence for Metals recycle (NMR) is proactively working with sites across the DOE Complex to divert tons of DOE excess material from our nation's



landfills and disposal cells to recycle and reuse alternatives. NMR has successfully been able to leverage cold war legacy equipment and materials to accelerate cleanups and promote Reindustrialization activities at DOE sites. NMR has succeeded in developing and implementing project-specific sales agreements and national sales and partnering agreements to return these materials, where applicable, to the commercial markets.

Over the last two years, NMR has facilitated the recycle and reuse of over 23,000 metric tons of various material and equipment resulting in an estimated \$37.4M cost avoidance for DOE. These successes have been achieved by following activities:

- * Through Complex-Wide Agreements with industry sites for resale and reuse of low-level radioactive waste drums from DOE sites.
- Through the Copper Wire and Windings Recovery Project which resulted in reclamation and recycling of 1,216 metric tons of copper saving Fernald \$ 1.5 million in FY 1999 alone.
- Through community reuse agreements, three of DOE sites will be able to save \$ 2.6 million in disposal costs.
- NMR has developed a course on dispositioning materials and by participating on various subcommittees that dictate at what levels materials and equipment may be released from sites for recycle/reuse.

With the above successes behind them, NMR continues to work to find additional opportunities for safe, environmentally protective, and cost-efficient recycle and reuse of equipment and materials.

For more information, contact Vince Adams, ORO at (865) 576-1803.

ENVIRONMENTAL PREFERABILITY

Non-Lead Ammunition at Oak Ridge's Firing Range

At the Oak Ridge Central Training Facility "Tire House", a live-fire shoot house, 10,000 rounds of 9mm ammunition are expended annually. This project converted the range



to non-lead ammunition for the demonstration of both ES&H, and cost savings for the new non-lead bullet technology. A one-time investment of \$32,000 avoids annual expenditures of \$45,000. The annual \$48,000 annual clean-up cost was reduced to a simple \$3,000 maintenance effort. The powder collected in the new bullet traps will be recycled into new bullets. The ability to recycle the bullets is integral in the cost effectiveness of this project.

This project has application at additional ranges in Oak Ridge, at most outdoor ranges across DOE, DoD and commercial ranges. Prior to the implementation of this project, it was not safe for the users to train in the live-fire shoot house with lead 5.56 ammunition due to ricochet and back splatter of the lead. But with the current technology's advancements in

controlled penetration and reduced collateral damage, it is now safer for the user to use the non-lead ammunition in this scenario or other close proximity shooting.

This project also eliminated employee exposure to lead during firing practice, and frangible bullets reduce risk associated with ricochet. DOE currently expends 10 million rounds of lead ammunition annually in practice facilities. The lead bullets present a hazard to both the environment and the shooter from lead vapors as rounds are fired. A conservative estimate is that for every dollar spent on ammunition, there will be 100 dollars spent on clean up. This technology has applicability across the DOE reservation, DoD and most outdoor ranges.

For more information, contact Susan R.C. Michaud, OR at (865) 576-1562.

ENVIRONMENTAL RESTORATION

Composting of High Explosive-Contaminated Soil at Pantex

The Pantex Environmental Restoration Department is using an innovative new technology called full-scale windrow composting to remove high explosives (HE) from contaminated soils at Pantex. In CY 1999, about 3000 cubic yards of HE-contaminated soil was treated.



Due to the past operations at Pantex HE Burning Grounds, some soil has been contaminated with levels of HE that requires remediation. Traditional disposal of the soil off-site costs about \$396 per cubic yard. The cost of this unique composting technique is

about \$82 per cubic yard. To date, this technology has saved DOE more than \$940,000 in operating costs.

The technique is fairly simple. It requires three main ingredients. The first is cow manure. This commodity is in great supply in the Texas Panhandle, and operators of the many cattle feedlots in the area are more than happy to supply all the product we can use. The second ingredient is wood chips. The City of Amarillo provides this to the plant from their ongoing operation to grind up fallen tree limbs. The final ingredient is the contaminated soil.

First, the cow manure and wood chips are placed in a short windrow and given a day or so for the microbes to start working. When the internal temperature reaches about 50°C, it indicates the proper thermophilic conditions exist. The contaminated soil is then placed over the windrows and mixed in with the base of manure and wood chips. The internal conditions of the windrow are monitored to keep them near 50°C with a moisture content of 50%. Every other day the windrow is turned over using a windrow turner and moisture is added as needed.

The microbes have been very successful in the degradation of the three types of HE present in the soil HMX, RDX, and TNT. The technique has reduced the HE present in the soil by 90% in 20 days of treatment.

For more information, contact Jim Luginbyhl, PX at (806) 477-5607.

INTEGRATED PLANNING AND DESIGN

Integrated Plan to Re-use Concrete in Ohio Region

DOE Ohio is promoting ways that its five sites can work together to save money to meet their budget limitations as closure sites. A team of site waste managers and



technology and P2 coordinators was formed to share experiences and resources and to work together on common initiatives to save money. Since waste processing and disposal costs make up 40% of the total DOE Ohio closure budget, this area offers a great opportunity for impacting the Ohio

budget challenge. The first initiative that was pursued was the concrete crushing and reuse.

An initial composite schedule of possible crusher use at the five sites for the next five years showed that the equipment will be fully utilized only during the fourth year of operation. DOE Ohio prepared life cycle analyses for Mound, Columbus and Fernald. The approach was reviewed by the Center for Life Cycle Analysis at Oak Ridge National Laboratory and was approved for implementation.

The five sites initiated an integrated plan for concrete re-use using one shared mobile crushing unit periodically at each site. The lead contractor, BWXT of Ohio at Mound, worked closely with DOE Ohio, Mound and Oak Ridge to perform life cycle analyses, establish volumetric acceptance criteria, and procure a used Hanford crusher, so that most crushed concrete will be re-used on-site as backfill. Savings of more than \$15M and low level radioactive waste avoidance of more than 40,000 m³ were calculated. This integrated plan among sites is a model for similar opportunities within the DOE complex.

For more information, contact John W. Krueger, Mound at (937) 865-4801.

INFORMATION SHARING

SRS Large Scale Demonstration and Deployment Project

Technologies from the 321-M Facility's Large Scale Demonstration and Deployment Project (LSDDP) were championed and promoted by the LSDDP team. The project



goals were not only to demonstrate new and improved D&D technologies but to facilitate additional deployments of the technologies by sharing information with potential end users, and ultimately, to help to bring about significant cost savings. The objective was to sell DOE site M&I project managers on the usefulness of the new and improved technology, facilitate additional deployments of the technology by sharing information with potential

end users, and ultimately, help to bring about significant cost savings over the traditional or baseline approaches.

Some of the work included:

- Alara 1146 Strippable Coating (OST Reference #2314)
- Size Reduction Machine (OST Reference #2395) (pictured above)
- Strippable Coatings for Decontamination
- Size Reduction Machine
- DDFA 1998 Mid-Year Review Meeting, Morgantown, West Virginia
- Environmental Advisory Committee Meeting, Aiken, South Carolina
- Spectrum '98, Denver, Colorado
- Ames Laboratory Meeting, Iowa State University, Ames, Iowa

The LSDDP demonstrated and deployed technologies for improved radioactive waste characterization and facility decontamination and dismantlement. Reports, fact sheets, a web site, exhibits, technical papers, magazine articles, local news coverage, DOE newsletters, and work with others were used to communicate project successes. The Team's thorough marketing of the technologies exemplified what is needed for effective information sharing.

For more information, contact Tim Coffield, SRS at (803) 557-6316.

SOWING THE SEEDS FOR CHANGE

Pollution Prevention Opportunity Assessments for Research and Development

To meet the needs of research and development staff, the Pacific Northwest National Laboratory (PNNL) developed a unique methodology for assessing pollution prevention



opportunities in a research laboratory environment. The adapted methodology was refined over several years of conducting assessments at PNNL and was published in April 1999 in the book, *Pollution Prevention Opportunity Assessments for Research & Development Laboratories*. The handbook is organized around six steps.

Following the publication of this handbook for R&D

laboratories, two sequels related to design assessments for facilities and environmental restoration activities are planned.

PNNL used the assessment methodology in FY 1999 to conduct nine assessments identifying 33 opportunities that, if implemented, could result in an annual cost savings of \$1.8 million. PNNL researchers who used the handbook commented positively on how it helped them step through the process.

For more information, contact Kim M. Fowler, PNNL at (509) 372-4233.

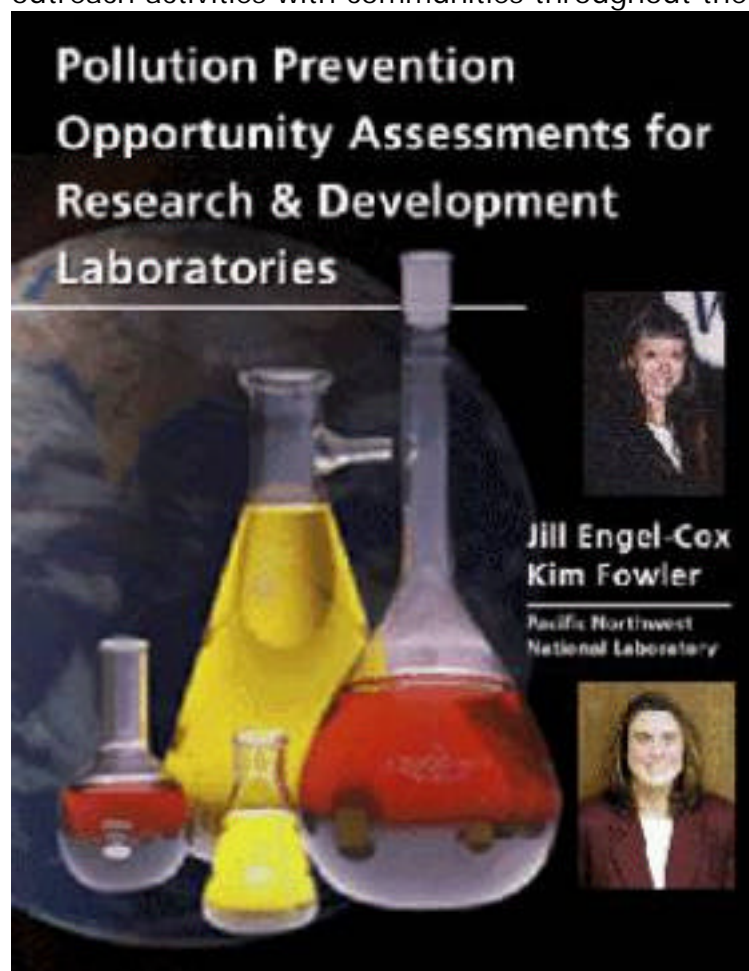
OUTREACH

PNNL Commits to Help the Community Prevent Pollution

The Pacific Northwest National Laboratory (PNNL) has been involved in numerous outreach activities with communities throughout the Pacific Northwest. These activities

fall in the areas of community activities, education, and special events. The results of these activities fulfill PNNL's pollution prevention outreach goals:

- Increase waste reduction programs within the communities
- Raise awareness for waste reduction practices in the communities
- Provide educational tools for teachers
- Provide information and training for communities and students
- Be a resource for the communities in the pollution prevention/sustainability fields



Due to PNNL's participation in various activities, in one year, they were able to contribute to the regional economy directly and indirectly by generating 7600 jobs and \$395 million in total wage income. PNNL contributed to the cultural component of the community more than \$300,000 and untold contributions by staff members through their participation in a wide variety of community activities.

For more information, contact Sandra Cannon, PNNL at (509) 372-6210.

OUTREACH

Environmental Excellence in Pollution Prevention

The Environmental Excellence in Pollution Prevention (*EXP2*) awareness program was initiated in July 1999 and involved approximately 3900 employees in the application of



ISO 14001, the Integrated Safety Management System, and pollution prevention and waste minimization activities. Program information and activity sections were presented in a pamphlet format. The *EXP2* pamphlet was a driving force in helping employees understand the company's Environmental Policy; locating and reviewing environmental documents and procedures; comprehending Affirmative Procurement, material exchange, and company recycling programs. It also demonstrated the benefits of becoming actively involved in home and community reuse and recycling initiatives.

The *EXP2* pamphlet was divided into three sections containing a variety of activities and responses to regulatory, pollution prevention,

and waste minimization programs. Employees completing Section 1 received a notebook, pad, and pen each made with recycled-content material. Those completing six entries in Section 2 received a desktop calculator made of recycled-content plastic and operable by battery or solar power. Employees completing Section 3 were eligible for the drawing of 100 Global Positioning Systems (GPS). The drawing was held September 22, 1999, during National Pollution Prevention week.

During the presentation of awards, many employees commented that this awareness program gave enlightening information on the Laboratories environmental programs and documentation, and produced a positive effect in work attitude through recognition of pollution prevention responsibilities. There was a great show of enthusiasm for completing projects on the home front and community. Employee participation was high in all of these voluntary programs. This awareness program exemplifies the Idaho National Engineering and Environmental Laboratory's (*INEEL*) leadership in promoting pollution prevention and waste minimization programs at the federal government level.

For more information, contact David Janke, INEEL at (208) 526-6327.

RECYCLING

The Copper Wire and Windings Project – A Team Approach to Materials Reuse

Rather than bury 1,340 tons (1,216 metric tons) of contaminated copper wire and windings from the Fernald site, the DOE Oak Ridge and Ohio Field Offices and a



commercial company worked together to develop a recycling alternative. This saved DOE \$7.3 million in disposal and cleanup costs, accelerated schedules at the two sites, and led to the establishment of a permanent metals treatment facility with 20 new jobs.

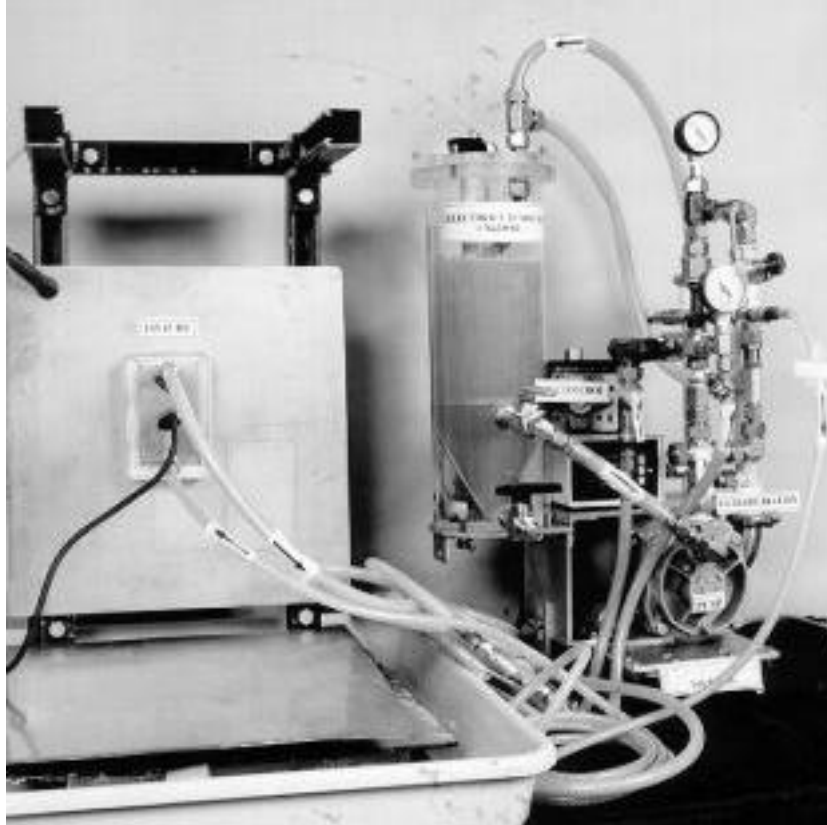
The copper material was transferred from Fernald to the East Tennessee Technology Park (ETTP) for decontamination and recycling by Decon and recovery Services of Oak Ridge, LLC (DRS), a DOE Reindustrialization client. Fernald had budgeted \$1.5 million for disposal of this material at the Nevada Test Site. DRS accepted the copper, a cash payment of \$1.1 million, revenues from the copper sale, and surplus heavy equipment. The success of this project was due to the innovative use of a team approach that encompassed both the government, regulatory agencies, safety organizations, transportation authorities and private sector organizations.

For more information, contact Alisa Rhodes, Fernald at (513) 648-4968.

WASTE PREVENTION

Electrolytic Decontamination of Gloveboxes

Discard of transuranic contaminated metallic waste is expensive. Decontamination to meet Low Level Waste criteria results in an order of magnitude lowering of costs and



enables material reuse or recycle. Decontamination at the source reduces exposure risks to workers, public and environment in subsequent discard operations. An in-situ plutonium glovebox decontamination method performs a rapid, uniform electrolytic etch of the metal surface, resulting in the removal of the surface contamination. Solution recycle eliminates aqueous process wastes. This technology has been successfully demonstrated during fiscal 1998 and 1999 toward routine implementation.

The process is now being widely implemented at the LANL plutonium facility with deployment to other LANL operations expected. Additionally, the process is now being examined for implementation complex-wide. The most likely sites for rapid deployment include Rocky Flats Environmental Technology Site, Savannah River Site, and Hanford. Inquiries into this technology and technological discussions are progressing with all these sites. Additional global interest has been shown by the Former Soviet Union, France, and Argentina. Additional applications of the technology are also being pursued, including the decontamination of non-ferrous metals (Al, Be, Co, and Cu alloys) and various geometries (weapons components, piping, nuclear material packaging components, and others).

For more information, contact Douglas Wedman, LANL at (505) 665-7140.

**2000 DOE Pollution Prevention
Award Nomination
Abstracts**

AFFIRMATIVE PROCUREMENT

Affirmative Procurement Training Contributes to 100% Purchase of EPA-Designated Products Goal at RL

The US Department of Energy Hanford Site developed Affirmative Procurement training to assist in meeting the goal of 100-percent purchase of EPA-designated products by December 31, 1999. The individuals who actively purchase or specify materials were all made aware of the new requirements listed in the Executive Order 13101 as well as other pertinent information related to affirmative procurement. Over 350 Procurement Specialists and Government P-Card Holders were trained in affirmative procurement practices. The Project Hanford Management Contractor improved its purchase percentage of EPA-designated products from 84% (with exclusions) in FY 1997 to 98% (with exclusions) in FY 1999 due in a large part to the awareness the training provided.

For more information, contact Anna Beard, RL at (509) 376-7472.

ENVIRONMENTAL PREFERABILITY

Purchase and Installation of Paper Disintegrators

Pantex Plant generates tons of classified media that must be sanitized. The methods approved for sanitation of classified matter include shredding and incineration. Pantex Plant operates an incinerator onsite under a Standard Exemption granted by the Texas Natural Resources Conservation Commission (TNRCC). Pantex incinerates approximately 34 tons of classified matter annually. In an effort to reduce the amount of paper incineration, Pantex Plant has purchased a number of disintegrators. A disintegrator is a "super shredder" of sorts that will allow Pantex Plant to effectively and efficiently sanitize its classified matter in compliance with appropriate regulations.

For more information, contact Jim Luginbyhl, PX at (806) 477-6507.

Purchase and Installation of Energy Efficient Lighting at Sandia National Laboratories/New Mexico (SNL/NM)

The group revamping process at SNL/NM was utilized to successfully implement facility lighting retrofits. The success of the retrofit projects has led to recent improvements with regard to SNL/NM's standard specification for all future lighting needs. The facility retrofits will result in significant energy and maintenance related savings. In addition, emissions of greenhouse gases to the environment will be reduced.

For more information, contact Ralph Wrons, SNL/NM at (505) 844-0601.

ENVIRONMENTAL PREFERABILITY

Lead Encapsulation Reduces Risk

Lead bricks and sheets required for radiation shielding in some areas increase personnel exposure to lead, increase personnel handling requirements (OSHA), and potentially generates mixed (RCRA hazardous and radioactive) waste. The Decontamination Facility encapsulated lead bricks and sheeting to decrease and eliminate these hazards to human health. The encapsulation of lead has eliminated personnel exposure to lead, required OSHA lead handling training and has reduced the potential generation of a mixed waste stream. This provides an excellent example of an environmentally preferable solution to a typical nuclear waste issue.

For more information, contact Tim Coffield, SR at (803) 557-6316.

ENVIRONMENTAL RESTORATION

Incorporating P2 into Environmental Restoration and Decontamination and Demolition Activities at Sandia National Laboratories

Through the development of a network of pollution prevention (P2), environmental restoration (ER) and decontamination and demolition (D&D) professionals, waste reduction has become an integral part of all activities. Implemented P2 practices include: technologies to separate clean from radiologically contaminated soils; use of launderable personal protective equipment; and segregation, decontamination and recycling of metals, wood, circuit boards, classified components, batteries and concrete. In FY 1999, these practices reduced project costs by over \$500,000, with a 32% reduction in the generation of waste.

For more information, contact Tony Roybal, SNL at (505) 284-2475.

ANL-E Phytoremediation Project

Solid and liquid waste from Argonne activities were disposed of in the 317 and 319 Areas during the 1950s. Volatile organic compounds (VOCs) and tritium have been released into the soil and groundwater from those wastes. Argonne is now using phytoremediation to remove or destroy contaminants in the soil and groundwater. Phytoremediation is the engineered use of green plants, such as trees and grasses, to remove, contain or render harmless environmental contaminants in soil or groundwater through the process of transpiration. During this process, contaminants in the water are taken up by the plants, broken down into less toxic compounds, or vaporized out of the leaves with the transpired water. The Phytoremediation Project has reduced overall remediation costs by \$500,000 compared with the use of conventional groundwater containment and treatment methodology. In addition, savings attributable to minimized operation and maintenance activities are estimated at \$90,000 annually.

For more information, contact Keith Trychta, ANL at (630) 252-1476.

ENVIRONMENTAL RESTORATION

LASAGNA TM Soil Remediation Technology

Excavation and disposal of 311 cubic yards of trichloroethene (TCE) contaminated soil was avoided at DOE's Paducah Gaseous Diffusion Plant (PGDP) through a pilot program using an innovative soil cleaning process. Using layered treatment zones and in-ground electrodes, the contaminated soil was cleaned using the in-situ technology, Lasagna TM, avoiding approximately \$625K in conventional excavation and disposal costs. The Lasagna TM success has led to its selection as the remedy for an additional 10,000 cubic yards of contaminated soil and future savings of approximately \$20M. Lasagna TM is suited for applications at many other sites.

For more information, contact Brian Bowers, OR at (270) 441-5057.

Changing the Approach to Pollution Prevention Enhances Success at Hanford

Bechtel Hanford Inc. implemented a series of innovative techniques that changed the typical approach used in reducing waste resulting from the execution of cleanup, and decommissioning activities at the Hanford Site. Techniques such as Value Engineering and a Data Quality Objective process have been incorporated into project activities as well as partnering with regulators and implementing new technologies. These initiatives have resulted in documenting more than \$50 million in cost avoidance and reducing greater than 300,000 tons of cleanup waste in FY 99.

For more information, contact Douglas K. DuVon, RL at (509) 372-9182.

INFORMATION SHARING

Where in the World is Y-12 Waste Recycled

Where in the world is Y-12 Waste Recycled? This was the title of the new Y-12 Plant Recycle Video used to train employees on the steps to recycle at the Y-12 Plant. The terminal objective of the training is to educate all the Y-12 Site Employees on the "ways and means" of recycling at Y-12. The enabling objectives include defining the waste streams, defining the methods for recycling, and showing just exactly where recyclables go and how they are used. This type of training provides the employees with the complete closed-loop picture of recycling. The training includes lecture, overheads, a 10-minute video, and an accompanying brochure on recycling. Employees are taught not only about recycling, but are briefed on pollution prevention and the importance to reduce the amount generated at the source.

For more information, contact Ana Gonzales, OR at (423) 241-4212.

INTEGRATED PLANNING AND DESIGN

Waste Prevention by Design – SRS Compactor Project

The Super Compactor Project Design Team accomplished close to the impossible for a small project, saving as much as its total installed cost by implementing pollution prevention principles and working with other DOE sites to reuse resources.

The Team used a Super Compactor from West Valley that would have cost approximately \$1 million. The compactor was reconditioned and design changes incorporated to accommodate site excess equipment as major components. The Team incorporated design features to improve worker stay-time, portability and ease of disassembly. The Compactor Project saved approximately \$1.7 million on installation and will save over \$23 million in waste disposal cost over 5 years due to volume reduction.

For more information, contact Tim Coffield, SR at (803) 557-6316.

Process Evaluation Project

In 1999, Brookhaven National Laboratory implemented three major environmental improvement projects designed to prevent pollution from past, present, and future activities. These projects, the Facility Review Project, the Process Evaluation Project, and the Environmental Management System Improvement Project remedy vulnerabilities from past practices, assess the environmental aspects and impacts of current operations, and develop an Environmental Management System (EMS) to plan for, minimize and control environmental impacts in the future.

For more information, contact George Goode, BNL at (631) 344-4549.

INTEGRATED PLANNING AND DESIGN

Integrating P2 Into ISM

Preventing or reducing the generation and release of pollutants, contaminants, hazardous substances, or wastes at the source, or reducing the amount for treatment, storage, and disposal through recycling is what the Pollution Prevention (P2) program is all about. P2 has been successfully integrated into ISMS/EMS by becoming a part of the NEPA review process and the chemical management process. P2 is no longer an extra curricular activity, it has become the standard for the way we do business.

For more information, contact John D. Griffin, ID at (208) 526-6997.

Y-12 Plant Model Facility Demonstration Incentive to Perform

There are many benefits from implementing pollution prevention projects such as reduction in waste treatment, storage, and disposal cost and protection of employee and the environment. In FY 1999, the Y-12 Plant identified and initiated pollution prevention projects that will result in the reduction of over 370,000 kg of waste at an estimated cost savings of over \$1.1 million. The goal of such an initiative is to establish a contractor performance incentive to: minimize the impact of Departmental operations on the environment; improve the safety of operations and energy efficiencies by reducing the generation of waste and pollution; substantially reducing or eliminating acquisition and use of products containing hazardous substances or toxic chemicals; and achieve optimal efficiency in the consumption of raw materials, energy, water and other resources. Information related to the development and related success of the Y-12 Plant performance are the basis of this award nomination that is "Integrated Planning and Design" at the Y-12 Plant. This performance based incentive program received so much management attention and support that the incentive was exceeded in both FY 1998 and FY 1999.

For more information, contact Ana Gonzalez, OR at (423) 241-4212.

INTEGRATED PLANNING AND DESIGN

Stabilization of Category 3 Waste

Low-level waste was stored in high integrity containers, tripling waste volumes. The containers were designed to stabilize high-activity waste and keep it stored in wet environments, an unnecessary measure taken for low-level waste stored in an arid area.

Hanford eliminated the use of the containers and developed a new stabilization method that used a special concrete formulation to stabilize and store the low-level waste.

Use of this method decreased the waste associated with overpacking, correspondingly increasing the storage space in the burial trenches. The result was an annual reduction of 1,300 cubic meters of waste and a cost savings of \$3,290,300.

For more information, contact Anna Beard, RL at (509) 376-7472.

MODEL FACILITY DEMONSTRATION

Model Facility Integrated Pollution Prevention Culture

The Strategic Petroleum Reserve (SPR) has taken the innovative approach of integrating pollution prevention into the fabric of each employee's day-to-day activities. This approach evolved over several years from introduction of pollution prevention principles to provision of tools, illustration of benefits, and celebration of successes - including state and national awards for specific efforts. During 1999 the SPR Pollution Prevention program reduced waste by approximately 13,000 tons, contributed to savings of nearly four million dollars, and created innumerable intangible environmental benefits. It's these measurable and intangible benefits that distinguish the SPR program as a model now and into the future.

For more information, contact William Bozzo, SPR at (504) 734-4653.

Building K-1416 Waste Reduction

As a result of her conscientious efforts, Ruth Ann Bates found alternate uses for 57,000 pounds of surplus chemicals thereby avoiding their disposal as hazardous waste. The chemicals were in usable form but were out of date or otherwise not returnable to the manufacture. Shipment to local chemical companies and identification of on-site uses resulted in cost savings of approximately \$250K.

For more information, contact G. D. Drexel, OR at (865) 241-1234.

MODEL FACILITY DEMONSTRATION

Hanford's Centralized Consolidated Recycling Center

There was a belief that Hanford's total annual dangerous waste could be reduced by redirecting certain waste streams to a centralized center where they could be consolidated until sufficient quantity was accumulated to make recycling feasible. The Department of Energy and its contractors teamed with the Washington State Department of Ecology regarding development of a Centralized Consolidation Recycling Center (CCRC) on the Hanford Site. After successful negotiations, the proposal was agreed upon by all parties and thus the CCRC was born. The CCRC is funded through Pollution Prevention/Waste Minimization Program (National). By establishing the CCRC, the Site has recycled 260.54 metric tons of materials that would have been disposed of as hazardous/sanitary waste. The CCRC has saved the Site over \$2,058,340 in site-wide cost avoidance.

For more information, contact Anna Beard, RL at (509) 376-7472.

NMS&S LLW Performance in the Nineties

The facilities represented by the Nuclear Materials Stabilization & Storage (NMS&S) division at the DOE Savannah River Site have demonstrated model performance in the reduction of Low Level Radioactive Wastes (LLW) during the decade of the nineties. They achieved greater than an 85% reduction in LLW generation from operations in 1999 with all four major facilities operating as compared to the 400,000 cubic feet of LLW routinely generated annually going into the nineties resulting in \$37,000,000 in life cycle cost avoidance. This continued commitment to waste reduction is a model for the DOE complex.

For more information, contact Tim Coffield, SR at (803) 557-6316.

OUTREACH

Environmental Awareness Through Participation

The Pollution Prevention Team at the Albuquerque Operations Office (ALO) has actively participated with Statewide Organizations to propagate environmental programs within the State of New Mexico. For example, State Green Zia Program, the ALO team participated in the development of the program including training, awards and valuation of recognition submissions. The ALO team is involved in the Statewide celebration of both Earth Day and New Mexico Recycles Day through commentary in the local newspaper and radio station. ALO participates as a board member of Keep New Mexico Beautiful and the New Mexico Recycling Coalition. For additional detailed information please refer to the hard copy submission.

For more information, contact Mike Sweitzer, ALO at (505) 845-4347.

Simple Steps in the Community Towards Environmental Excellence

The Kansas City Plant (KCP) has joined with community environmental stakeholders to increase public awareness on environmental issues and to educate the community about the "simple steps" they can take towards environmental excellence. This involvement with environmental stakeholders consists of associates serving on local and state environmental Boards of Directors, steering committees, and participating in community environmental events. Through examples such as these, KCP has clearly demonstrated its involvement in the community to promote understanding of environmental issues and to encourage people to take simple steps toward environmental excellence.

For more information, contact Bob Beauchamp, KCP at (816) 997-3586.

OUTREACH

Community Action to Prevent Pollution and Promote Recycling

The Princeton Plasma Physics Laboratory (PPPL) has hosted many public events. Two notable events during 1999 were the Earth Day Celebration and America Recycles Day. The third annual Earth Day Celebration at PPPL during April of 1999 involved ten local area middle schools and children of PPPL staff in a poster contest with the theme "Your Energy in the 21st Century". Prizes were awarded to 12 winning posters. The Franklin Institute of Philadelphia presented an interactive demonstration on various forms of electrical energy. For America Recycles Day, PPPL contacted the schools that participated in our Earth Day Celebration and encouraged them to submit pledges and dedicate November 15, 1999, to recycling projects. On November 9, 1999, PPPL celebrated ARD by hosting the EPA WasteWise Broadcast Forum on Buying Recycled. The NJDEP and Shaw Commercial Carpet, Inc. gave presentations on how businesses and facilities can Buy Recycled. The Laboratory Director presented 10 awards to PPPL's 1999 "Green Machines"; staff members whose efforts to Reduce, Reuse, Recycle and Buy Recycled helped PPPL exceed its goals in FY99. The stimulating activities allowed the local community and Laboratory to share knowledge and commitments for pollution prevention and recycling.

For more information, contact Thomas J. McGeachen, PPPL at (609) 243-2948.

Teaming for Success: P2 Week Promotion

National Pollution Prevention Week (P2 Week) is celebrated throughout the nation the last full week in September. This year, Waste Management Hanford Pollution Prevention/Waste Minimization (P2/WMin) teamed up with DOE-RL, the City of Richland, and Home Depot to sponsor P2 Week in the local community. The weeks' activities were highlighted by a week-long promotion of environmentally friendly products at the local Home Depot store. Vendors were invited to promote their environmentally friendly products. In addition, Home Depot held kids' day event, in which kids in the community were invited to build a wooden "Recycling Awareness" bank.

For more information, contact Anna Beard, RL at (509) 376-7472.

OUTREACH

SRS P2 Communication and Awareness Program

The Pollution Prevention (P2) Team is committed to heightening awareness of P2 principles to SRS employees and citizens of the Central Savannah River Area. Earth Day, SRS Technology Day and Pollution Prevention Week activities highlighted SRS's commitment to community outreach as well as environmentally friendly work practices. Local organizations were encouraged to share information on their P2 initiatives and SRS divisions highlighted past successes as well as ongoing initiatives at these events. Public displays, employee P2 commitment pledges, and educational visits to 25 classrooms (over 650 students) in surrounding counties were some of the activities used by the Team to communicate P2 awareness.

For more information, contact Tim Coffield, SR at (803) 557-6316.

RECYCLING

DMSO Recycling in Buildings 12-17 and 12-19

High explosive (HE) dissolution requires the use of dimethyl sulfoxide (DMSO) generating significant volumes of nonhazardous state regulated Class 1 waste. Investigation showed that three plate fractional distillation of solvent water mixtures removes the water from the mixture. The DMSO is then distilled to provide final purification. The water is removed by fractional distillation or substituted for tap water in the HE dissolution process. The only waste from dissolution is sludge from the DMSO purification process. This is an expansion of the recycling from the HE formulation processes. This type of recycling will also be expanded into the HE synthesis processes.

For more information, contact Jim Luginbyhl, PX at (806) 477-6507.

High Explosive Formulation Solvent Recovery

High explosive (HE) formulation requires using several hazardous chemicals generating significant volumes of hazardous waste. Over 40% of Pantex Plant's hazardous waste generated during January through March of 1999 was traced to the HE formulation processes. Investigation showed that simple distillation of solvent water mixtures would return over 90% of the solvent for reuse in these processes, making the resultant waste nonhazardous. The waste water remaining after distillation is substituted for tap water in water filtration air cleaners making the process zero discharge. Pantex is expanding this recycling into HE synthesis and dissolution processes.

For more information, contact Jim Luginbyhl, PX at (806) 477-6507.

RECYCLING

MailStop A1000

Los Alamos National Laboratory receives approximately 600 tons of junk mail yearly that contributes significantly to the Sanitary waste stream. The Bus-4 Mailroom Staff Developed a system for recycling this mail by creating a mailstop to receive junk mail from Laboratory employees called MS A1000. When employees receive unwanted mail they label it MS A1000 and put it into the outgoing mail. Books, magazines, transparencies and toner cartridges are also sent to MS A1000 for recycling. The Mailroom employees sort the contents of MS A1000 for recycling and on average recycle approximately ten metric tons of material monthly, greatly reducing the Sanitary waste stream and helping the Laboratory meet performance measures set by the University of California.

For more information, contact Eleanor Chapman, LANL at (505) 665-4651.

A New Life for Old Material

Historically, the waste from construction and demolition (C&D) projects was disposed in local landfills. Now we are looking for better, more environmentally beneficial methods of using materials that were once considered to be waste. In FY 1999, a total of 2,283 tons of soil from construction projects, and 383 tons of concrete and asphalt, were diverted from being disposed of in the local landfill by finding ways to reuse and recycle the material.

For more information, contact Bob Beauchamp, KCP at (816) 997-3586.

RECYCLING

BNL Recycling – A Win-Win Partnership

In an era of rapidly escalating disposal costs, Brookhaven National Laboratory (BNL), the Town of Brookhaven and some local vendors have forged a symbiotic partnership that has resulted in win-win relationships. These relationships are a win for the Lab as they have saved the Lab hundreds of thousands of dollars per year in potential disposal costs. On the flip side, the recyclable materials have provided a valuable source of seed revenue for the town, in addition to saving valuable void space in the town's ash/land fill.

For more information, contact George Goode, BNL at (631) 344-4549.

Recycling of Ozone Depleting Substances

The Kansas City Plant (KCP) conducted a project to reclaim and recycle a class of ozone depleting substances, known as chlorofluorocarbons (CFCs), from a chemical mixture that was no longer needed. A process was developed to recover the CFCs from the chemical mixture. Over 30,700 pounds of CFCs were recovered. The recovered CFCs were sold to an approved reclamation facility for reclamation and reuse. This recycling project had two positive results - a net cost savings of \$143,000 and preventing the ozone depleting substances from being released to the environment.

For more information, contact Bob Beauchamp, KCP at (816) 997-3586.

RECYCLING

Lead Reuse in Hot Cell Construction

The construction of a "hot cell" for the management of high activity radioactive wastes was specified in the design of the sites' new waste management facility. Originally specifying concrete and steel to provide the desired shielding in the walls, two of the walls in the cell were redesigned to be constructed utilizing 172,000 pounds of lead brick from on-site that was destined for disposal at a cost of over \$300,000. The brick was sorted and selected based on condition and was stacked within special forms to provide the desired shielding.

For more information, contact Glen Todzia, BNL at (631) 344-7488.

MSRE Steam Dome Recycling

The Molten Salt Reactor Experiment (MSRE) Project has taken an active pollution prevention role by shipping two MSRE steam domes to an offsite vendor for recycling. The metal steam domes were originally part of a heat removal system for the reactor and were radioactively contaminated. The steam domes weighed approximately 1800 pounds each, with a combined volume of approximately 192 cubic feet. The domes were removed, packaged and transported to an offsite location for smelting and reprocessing into shield blocks to be utilized by another project. This hopes to be the first of many innovative pollution prevention actions.

For more information, contact Jeff Bale, OR at (865) 241-4878.

RECYCLING

SRS Recycling Improvements: More for Less!

The Savannah River Site (SRS) re-engineered routine sanitary waste recycling/disposal with the objective of increasing recycle rates while reducing overall sanitary waste program costs. Through a new subcontract with a local municipal material recovery facility, SRS has effectively doubled its routine sanitary waste recycle rate, from 25 percent to over 50 percent, while cutting recycling costs by over 70 percent. This translates to an annual savings of over \$220,000. SRS is not stopping there. Studies were completed on the feasibility of converting non-recyclable combustible waste into fuel pellets for energy recovery. If deployed, SRS could divert over 90 percent of routine sanitary waste from landfill disposal.

For more information, contact Stephen J. Mackmull, SRS, at (803) 725-3817.

Plutonium Uranium Extraction Facility Tunnel Locomotive Battery Recycle

The 30-ton railroad switchgear locomotive, "Little Toot" was used to push rail cars into the PUREX tunnels, which is an airborne radioactivity area. Lead/acid batteries were used to power the locomotive and had previously been disposed of as mixed low-level waste (MLLW). A decision was made to decontaminate and survey the batteries to determine if they could be free-released to an offsite vendor for recycling. The batteries were then decontaminated and subsequently determined to be free of contamination, which allowed them to be recycled. This recycling endeavor resulted in a MLLW reduction of 8 m³ and cost a savings of \$377,423.

For more information, contact Anna Beard, RL at (509) 376-7472.

RECYCLING

KAMS Project Material Recycle

The KAMS P2 Project Team overcame the pressures of an accelerated project schedule to do the right thing with waste and project management during a major building modification to support a new mission. They identified materials for recycle and encouraged radiological area recovery prior to major project work. This avoided approximately 1,600 cubic feet of low level waste and saved approximately \$500,000 from waste and laundry avoidance and productivity gain. They showed pre-planning for P2 pays.

For more information, contact Tim Coffield, SR at (803) 557-6316.

Expanding and Improving the Non-Hazardous Recycling Programs at Hanford

Hanford's Recycling Programs for non-hazardous sanitary waste have always been innovative and successful. This year there were significant changes to improve the quality of paper recycled through the "white" paper program. Separate containers were provided to collect newsprint, magazines and telephone books which, improved the quality of the white paper and increased the amount of paper recycled overall. The number of cardboard recycling containers was increased by 30% and the volumes collected also increased. The number of containers to collect glass, tin & plastic were significantly increased and tracking for toner cartridge savings and wood pallet recycling also began.

For more information, contact Anna Beard, RL at 509-376-7472

SOWING THE SEEDS FOR CHANGE

Changing the Approach to Pollution Prevention Enhances Success at Hanford

Bechtel Hanford Inc. implemented a series of innovative techniques that changed the typical approach used in reducing waste resulting from the execution of cleanup, and decommissioning activities at the Hanford Site. Techniques such as Value Engineering and a Data Quality Objective process have been incorporated into project activities as well as partnering with regulators and implementing new technologies. These initiatives have resulted in documenting more than \$50 million in cost avoidance and reducing greater than 300,000 tons of cleanup waste in FY 99.

For more information, contact Douglas K. DuVon, RL at (509) 372-9182.

Pollution Prevention Awareness and Path Forward – 2000 and Beyond

The Albuquerque Operations Office (ALO) National Pollution Prevention Program Team was instrumental in setting the path forward into the new century regarding the DOE National Pollution Prevention (P2) Program. ALO was honored to sponsor the 1999 DOE National P2 Conference in Albuquerque, New Mexico in November 1999. The focus of the Conference was the announcement, by the DOE Deputy Secretary, of new P2 and Energy Efficiency (E2) goals for the Department for 2000 and beyond. The ALO Team's contribution was highly significant. The ALO Team worked with many HQ Program Secretarial Offices (PSO's) and the Office of the Secretary in bringing P2/E2 awareness to the highest levels within the Department. We were successful in obtaining attendance, participation and support at the Conference from many PSO's and the Deputy Secretary.

We were very successful in this effort and believe we significantly contributed to P2/E2 awareness within the Department and were instrumental in setting the direction of the Department's environmental programs for years to come.

For more information, contact Mike Sweitzer, ALO at (505) 845-4347.

SOWING THE SEEDS FOR CHANGE

Incorporating P2 Into Core Business Practices at Sandia National Laboratories

To increase the effectiveness of the Sandia National Laboratories, New Mexico (SNL/NM) P2 program, a deliberate effort was initiated to create and connect a network of P2 resources and programs. Specifically, SNL/NM's P2 group opened a dialogue with the water conservation program manager, the energy management program manager, and the air emissions compliance staff, the procurement staff, and construction staff. These efforts created a climate where a multi-media approach is being used to make significant progress in the area of sustainable design and zero waste generation, and has helped to integrate P2 into SNL/NM's business practices.

For more information, contact Kylene Molley, SNL at (505) 284-3982.

Environmental Management System

The Relativistic Heavy Ion Collider (RHIC) was commissioned during a period when community members, politicians and regulators were assailing Brookhaven National Laboratory for poor environmental practices. RHIC managers implemented a formal Environmental Management System to proactively manage and control operations to prevent environmental impacts. Key system elements that contribute to cultural change and institutionalization of P2 concepts are Policy, Objectives & Targets, Environmental Management Program, Structure and Responsibility, and Training. This is the first DOE Office of Science program and the first Long Island-based organization recognized by ANSI as conforming to the international standard, ISO 14001.

For more information, contact George Goode, BNL at (613) 344-4549.

SOWING THE SEEDS FOR CHANGE

Pollution Prevention Information Portal – Providing an Innovative Approach to Obtaining P2 Information

Pollution Prevention (P2) information is scattered in many forms (web sites, newsletters, and other paper and electronic documentation), making it very difficult for DOE and other Federal Agencies to find the most up-to-date information on pollution prevention. Through a collaborative effort between the Office of Environment, Safety and Health (EH) and the Office of Science (SC), up-to-date P2 information is now available on the ES&H Information Portal. The ES&H Information Portal gathers the most dynamic of the links from EPIC - The Department of Energy's Pollution Prevention Information Clearinghouse, as well as provides access to the award-winning Materials Exchange Broker. This one-stop Information Portal provides users with daily updates on critical P2 information that can be used by the Field Operations Offices and contractors to implement a more cost effective P2 Program.

For more information, contact Arnold Edelman, HQ at (301) 903-5145.

The Oak Ridge Reindustrialization Program: Sharing Strategies for Recycle and Reuse

The U. S. Department of Energy Oak Ridge Operations(DOE-ORO) Assets Utilization (AU) Program leads the DOE Complex in developing innovative recycling and reuse policies and strategies. In Oak Ridge alone, the AU approach resulted in the recycling and reuse of more than 17,000 metric tons of materials at an estimated \$15.5 million savings. The commercial reuse of buildings has also resulted in dramatic waste avoidance and cost savings. The accomplishments were achieved by using a team approach that influenced change both within DOE-ORO and across the DOE complex, thus "Sowing the Seeds for Change" across the country.

For more information, contact Larry W. Clark, OR (865) 576-2678.

SOWING THE SEEDS FOR CHANGE

Concrete Recycling – A Precedent Setting Standard Operating Protocol Will Reduce 100,000 Cubic Meters of Waste

Decommissioning planners at Rocky Flats faced two huge challenges in returning the site to open space: (1) disposal of 100,000 cubic meters of clean concrete rubble projected from demolition projects, and (2) filling holes left after the removal of three large processing buildings. Initially, regulatory requirements and stakeholder opinion obliged Rocky Flats to plan for offsite disposal of the concrete and to bring in clean fill for the holes. However, by promoting the pollution prevention and cost savings benefits of reusing the building rubble to fill the holes, and through an outstanding cooperative effort, the idea gained regulatory approval.

For more information, contact Dave Maxwell, RF at (303) 966-4017.

Hanford's Strategy for an Integrated Approach to Pollution Prevention and Energy Efficiency

In 1998 and 1999, several significant initiatives were announced for Pollution Prevention/Energy Efficiency (P2/E2) which prompted Hanford to address the benefits in potential synergies between the two programs. A strategy was written to evaluate the existing two programs and enhance the efficient use of resources. Hanford's Strategy for an Integrated Approach to Pollution Prevention and Energy Efficiency describes the P2/E2 background and related regulatory requirements for each. The goals for both programs were addressed as were the regulatory requirements. The existing P2 and Energy Management programs were evaluated and recommendations for program integration were derived from all contractors and DOE-Richland Operations Office (DOE-RL) personnel. Implementation of the strategy will not only prevent pollution, but will enhance profits by reducing energy consumption.

For more information, contact Anna Beard, RL at (509) 376-7472.

SOWING THE SEEDS FOR CHANGE

SRS Clean Waste Diversion Project

The Clean Diversion Project initiated a core foundation and "sowed the seeds for change" for defining a sustainable culture that embraces segregation and diversion of clean waste from radioactive waste. The SRS Team: 1) developed and published the rules for using a graded approach to release materials: 2) established pilots for two projects in SRS facilities to segregate waste: 3) procured innovative monitoring techniques specific to waste stream release: and 4) utilized Radiological Engineering personnel to optimize and deploy new practices. An approximately 25% reduction (approximately \$6 million per year) in total LLW is expected to result from these efforts.

For more information, contact Tim Coffield, SR at (803) 557-6316.

WASTE PREVENTION

Waste Prevention at the SNL/NM Machine Shop

The implementation of coolant recycling systems at the Sandia National Laboratories/New Mexico Machine Shop is expected to reduce coolant waste generation significantly. Fine-tuning of systems could result in a waste reduction of 90-95%. Operational benefits will also be significant. In addition, coolant recycling at the Machine Shop is in line with SNL/NM's commitment to the operation of quality systems in accordance with ISO-9000.

For more information, contact Harry McCormick, SNL/NM at (505) 844-3714.

Low Purge = Big Savings

The modification of groundwater sampling methods to incorporate a new low purge volume process has reduced contaminated purge water generation from 150,000 gallons to 12,000 gallons in CY99. The process modification provides a more efficient means of determining when sample parameters stabilize. This reduces wastewater generation, reduces labor associated with sample collection, and permits field treatment of VOC contaminated water, thus eliminating the need to containerize and transport to an on-site treatment system. The CY99 cost savings realized by implementing this process modification were more than \$250,000.

For more information, contact Glen Godzia, BNL at (634) 344-7488.

WASTE PREVENTION

Waste Reduction and Improved Efficiency at ANL-E Central Heating Plant

Argonne-East's Plant Facilities and Services (PFS) has implemented a series of pollution prevention initiatives that have brought about sweeping changes in the operations of its Central Heating Plant (CHP). Argonne has made major operational improvements within the CHP, resulting in substantial cost savings, higher heating efficiency, and reductions in the amounts of waste and pollution generated on site. Examples of operational improvements include: eliminating the use of high sulfur coal as a fuel, recycling coal fines and fly ash, facility upgrades, revised operating methods, and implementing chemical storage and management improvements. These P2 operational improvements have resulted in cleaner, safer, more efficient, and less expensive steam production and have generated cost savings of over \$400,000 annually.

For more information, contact Keith Trychta, ANL at (630) 252-1476.

Making a Difference

The Office of Administrative Management and Support continues to play a leadership role in pollution prevention. Some of the accomplishments during 1999 include:

- All 324 copiers in HQ buildings have full duplexing capability.
- As required by EO 13101, only 30% post-consumer waste white paper is used.
- Usage of copiers increased by 26%.
- HQ fleet has expanded its use of alternative fuel vehicles.
- The photographic shop uses silver recovery methods from waste water.
- During America Recycles Week, displays were placed in HQ buildings and hand-outs were distributed to heighten the awareness of recycling among employees.

You can make a difference in pollution prevention when you carefully monitor your waste products. This will carry out from your work place into your community.

For more information, contact Brian D. Costlow, HQ at (202) 586-4375.

WASTE PREVENTION

ORNL Water Treatment Program

A team of ORNL and BetzDearborn personnel evaluated ORNL's water systems for laboratory buildings and operations. The results of the changes include reduced electrical operational costs, reduced blowdown to waste streams by 21,272,000 gallons, reduced water make up by 21,272,000 gallons, reduced chiller maintenance, extended life of equipment, minimized drum disposal, reduced the potential for environmental insults and health hazards associated with Legionella bacteria. With an annual program cost of \$30K, this team saved \$500K annually in utility costs, chemicals costs and drum management.

For more information, contact Susan R. C. Michaud, OR at (865) 576-1562.

Innovative Technologies Reduce TRU Waste and Accelerate Closure at Rocky Flats

Rocky Flats was faced with exorbitantly high cost options for disposing of high-plutonium and high-ameridium content radioactive transuranic (TRU) waste due to limitations placed on the amount of radioactive materials allowed in a 55-gallon drum destined for DOE's Waste Isolation Pilot Plant (WIPP). Three major innovative technologies--the Pipe Overpack Container, the Gas Generation Testing Canister, and Filtered Bag-Out Bags--allow more radioactive material to be placed in each 55-gallon waste drum while meeting all transportation and waste acceptance requirements. These three technologies together have already saved \$190 million and reduced the number of drums destined for WIPP by 23,600.

For more information, contact Dave Maxwell, RF at (303) 966-4017.

WASTE PREVENTION

CIF Blowdown to the ETF

The Consolidated Incineration Facility (CIF) off gas system generates a mixed (radioactive and hazardous) liquid waste that was stabilized by mixing with cement creating 21,000 cubic feet of 'blowcrete' annually. The CIF P2 Team completed regulatory reviews and approvals, modified the CIF off gas process and purchased a transport tanker to treat this waste stream through the SRS Effluent Treatment Facility avoiding the stabilization process. This reduces waste disposal volumes (no added cement) and secondary job control waste. The ten-year life cycle savings are almost \$45 million with about half the savings from waste disposal avoidance and half from waste management avoidance.

For more information, contact Tim Coffield, at SR at (803) 557-6316.

FB-Line Cameras Avoid Waste

The SRS FB-line P2 Team aggressively pursued opportunities identified in a waste composition/PPOA to avoid Low-Level Waste (LLW). When conventional methods of decontamination and cabinet maintenance failed to recover the Coupling Operating Room (COR), they installed remotely operated cameras to monitor alarm panels and provide process surveillance. This avoids stationing an operator 24-hours a day in the room resulting in savings of 768 cubic feet per year of LLW (approximately \$81,400/year). The total cost savings (labor, waste, materials, laundry, etc.) is approximately \$423,800 per year. In addition, radiation exposure received from this room has been reduced by 4 Rem per year.

For more information, contact Tim Coffield, SR at (803) 557-6316.

WASTE PREVENTION

ITL Pollution Prevention Project

ITL has excelled at solving difficult radioactive and hazardous waste problems. In 1999, ITL recycled 40,000 lbs. of radioactive contaminated lead. ITL implemented the Acid Digest Disposal Project as a pollution prevention measure to neutralize acidic liquid making it non-RCRA and much cheaper to dispose. ITL disposed of 1200 boxes of acid digest bottles containing sulfuric acid with plutonium, americium, or uranium. Total volume was about 10,000 liters in over 110,000 bottles. ITL also implemented pollution prevention and waste minimization measures to clean the 12 TRU Exposure Labs that were contaminated with Am-241, Am-243, Pu-239, Cm-244, U-233, and U-238 radionuclides. Decontamination was of sufficient quality to do other, non-radiological work in these labs. This year ITL also recycled about 13,000 lbs. of office paper and 9,000 lbs. of cardboard.

For more information, contact Steve Rohrer, ITL at (505) 845-1607.

Hanford's Return on Investment Program Saves Millions of Dollars

Hanford's Return on Investment (ROI) Program has successfully saved over 43,000 cubic meters of waste with the implementation of 47 ROI projects. These projects resulted in a cost avoidance of \$145 million and an average ROI of 5,120%. Richland has developed and refined a process to screen ROI proposals for implementation of only the most prosperous ideas. The process includes, identification of initiatives, training, proposal preparation, review and acceptance, monthly reports, and a final close-out report. The continuing success of the Hanford P2/Wmin Program is an example of solid teamwork, responsible leadership, and direct participation of Hanford Site contractors and DOE P2/Wmin Team members.

For more information, contact Anna Beard, RL at (509) 376-7472.

WASTE PREVENTION

Machining Coolant Management Program

Coolant used to machine parts becomes contaminated with oil and metal shavings during the process. Bacteria grow, causing lower pH buffering capacity, an odor, and corrosion. A Pollution Prevention Opportunity Assessment was conducted on the machining operations at the 272W Fabrication Shop to assist in identifying solutions. Two of the six opportunities evaluated were implemented by the end of FY99: (1) Machining Coolant Management Program; and (2) Coolant Replacement. The idea stemmed from the U.S. Department of Energy Rocky Flats Site as they were utilizing this same approach with great success for several years.

For more information, contact Anna Beard, RL at (509) 376-7472.

Filter System at the Effluent Treatment Facility Load-In Facility

A filter system was installed to filter sump wastewater before it was transferred to the Effluent Treatment Facility for treatment. Filtering the sump wastewater prevented sludge buildup in the tanks and reduced the chances of corrosion. The volume of mixed low-level waste reduced annually was 3.8 m³ and 1,900 m³ of hazardous liquid waste associated with the tanker clean out and the removal of sludge.

For more information, contact Anna Beard, RL at (509) 376-7472.

WASTE PREVENTION

Neutralizing of Waste

Processing of waste inorganic laboratory acid and caustic solutions in DOE-owned wastewater treatment facility prior to sending to Publicly-Owned Treatment Works saves approximately 10% per year in hazardous waste disposal costs. This elementary neutralization is allowed under Resource Conservation and Recovery Act "Permit-by-Rule". Costs for disposal as hazardous waste are approximately \$185 per drum for acids and approximately \$125 per drum for caustics.

For more information, contact Robert B. Webster, FETC at (412) 386-4475.